1. ***Describe the practice proposed for recognition and list its objectives. Detail how the practice is innovative, how it promotes high student achievement and how it can be duplicated?***

"Three Blind Mice" successfully integrates the art of technological design with language arts literacy. Currently existing as part of a Product Design and Invention course, a grades 9-12 elective, students are challenged with the problem of designing and building a mousetrap to successfully capture a live mouse or mice without killing or harming them in any way. The secret to this practice lies in extremely high student motivations. The teacher may select a single student or collaborative approach or, better yet, leave it up to the discretion of the students. This practice lends itself well to any comprehensive high school setting and can be adapted efficiently in the following curriculums: technology, gifted and talented, industrial arts, creative design, and science. First, students gather information about mice to learn their habits, physical attributes and unique features (electronically and through other library sources) as they pursue a plan to safely capture the small creatures. They are given specific design criteria which must be followed. Although mousetraps are often made of simple materials like cardboard, oaktag and tape, wood and plastic, students frequently show ingenuity in suggesting unusual, though surprisingly appropriate, materials.

Throughout this technological design process, an English teacher acting as a language consultant introduces the students to various selections of poetry and short fiction which all involve mice. In some instances the poems are very straight forward, other pieces, however, written by preeminent authors and poets, use mice as metaphors and initiate meaningful philosophic discussion. Students are guided into analysis and interpretation, during which they express and formulate their own opinions. They make powerful connections between the symbolism and ideas that lie within the poetry and their own real life situations.

The activity culminates on test day! Five live mice arrive on the scene and are placed on a specially contrived barricaded table top along with the lonely mouse traps. When the mice are released, the fun and frenzy begin. The mice scurry for the comers as the students cheer for them to come toward their traps. After a few minutes, when things quiet down, the mice get *encouraged* to start investigating the area. As the baited traps await a customer, the students begin to whisper to one another: "Look, he's going right for yours!" "My trap is on the wrong side of the table." "Uh, oh, I should have designed the ramp differently and placed the door on the other side! Next time....." As one bold mouse cautiously mounts the bread-crumb covered ramp, all eves focus on his movements. The creature continues to creep, sniffing and nibbling his way to the top of the ramp, where a Cheese Combo awaits atop of a trap door. After careful rodent consideration, the mouse moves forward, anticipating its culinary treat. At last the moment all have been waiting for! "Mickey" stands atop the trap door and the students stare attentively, astonished that he does not fall as the feast continues. Then, in one split second, the mouse dashes down the ramp and onto the safety of the table. "The trap door didn't release," groans the owner, already considering how he can improve his design. These tantalizing scenarios continue all period as many mice escape, making the few that are captured a true prize. The bell rings, signifying the end of the period, but no one leaves. Not even to go eat lunch. Who would ever imagine that getting students to leave the room would be a problem?

In fulfilling "Three Blind Mice," students are given first-hand opportunity to solve a genuine problem, starting with research and culminating in thoughtful assessment. This experience in brainstorming, planning, designing, making, testing and evaluating an original product as part of a technological design process is invaluable. The creative use of language through poetry and fiction (even moral issues arise) allows students to analyze, experience, and apply language to meaningful situations, express formulated opinions, gain a more intimate appreciation and understanding of the power of language. As problems in design construction develop, students interact freely with each other, critically thinking and discussing, as they help solve each emergent problem. As a final language exercise the students create and present their own poems or short stories involving mice or any other element of human experience we have discussed. In producing an original solution to a genuine problem, students find new meaning to the old saying, "Build a better mousetrap and the world will beat a path to your door."

"Three Blind Mice" is unusual in the way it promotes high student achievement in *all* different kinds of students. Generally non-academic learners, who have no interest in earning high grades or winning any other form of academic approval, are gratified by their success in this mouse venture. Their particular thinking skills (and the hands-on talents they possess in abundance) are rarely recognized in other classes. During this practice it's their turn to shine. The more academically-oriented students, concerned about grades and finding the "right answers" that will be rewarded with an A and high class ranking, are given the freedom to create imaginatively; often made anxious by tests and other scholarly rigors, these students tap into a different kind of classroom success, and they are exhilarated.

2. **Describe the education needs of students that the practice addresses and how they were identified. List the Core Curriculum and/or Content Workplace Readiness Standards and the practice addressed.**

The practice was developed as a result of the educational needs identified by several educational reform groups throughout the state and country and was recently approved by a district wide curriculum committee consisting of parents, teachers, administrators, students and board members. Nationwide efforts by the National Council for Teaching Mathematics (NCTM), National Science Foundation (NSF), and International Technology Education Association (ITEA) have all been considered in developing this integrated practice. The emphasis is on students as thinkers and problem solvers, rather than as empty shells ready to be filled with rote knowledge. Also existing as a common thread is the push toward integrated curriculum as a means of directing students to make purposeful connections.

At the state level, initiatives by the NJ State Department of Education and the Technology Education Association of NJ (TEA-NJ) played an important role in the development and validation of this practice. More specifically, the New Jersey Core Curriculum Standards and the Cross-Content Workplace Readiness Standards provided significant direction and validity. Within the New Jersey Core Curriculum Standards, the following Language Arts Literacy Standards/Indicators are addressed:

3.1 All students will speak for a variety of real purposes and audiences. (3.1:1,7,8,14,15,18)
3.2 All students will listen actively in a variety of situations to information from a variety of sources. (3.2:1,5)
3.3 All students will write in clear, concise, organized language that varies in content and form for different audiences and purposes. (3.3:1,2,3,4,7,9,13,16,17)
3.4 All students will read various materials and texts with comprehension and critical analysis. (3.4:18,25)
3.5 All students will view, understand, and use non-textual visual information. (3.5:2,11,17)

"Three Blind Mice" highlights all of the above standards in very specific ways. Students engage in a dialogue about poetry that links their own current concerns with the ongoing mouse activity (3. 1). As the students analyze various poems, they gain an understanding and appreciation of language through active listening and can evaluate increasingly complex ideas (3.2). As a final exercise, the students write a poem or story incorporating their feelings and insights about what has ensued (3.3). The diversity of the literature allows students to grow intellectually, socially and emotionally, as they consider universal aspects of human existence. They grow increasingly alert to the nuances of language (3.4). When researching mice, as well as various technicalities of construction, students actively seek out and use a variety of print and electronic media such as graphs, diagrams, pictures, drawings, magazines, television, computers and files (3.5). In culminating the unit, each student documents the experience in clear and precise expository style.

The following Cross-Content Workplace Readiness Standards/Indicators are addressed:

1. All students will develop career planning and workplace readiness skills. (1:3,5,7)
2. All students will use technology, information and other tools. (2:1,2,4,6,7,8,9,10)
3. All students will use critical thinking, decision-making, and problem solving skills. (3:1-15)
4. All students will demonstrate self-management skills. (4:2,3,4,5,9)
5. All students will apply safety principles. (5:1-9)

"Three Blind Nice" highlights all of the above standards in the following ways: Students explore career opportunities in the areas of product design, planning, fabrication, testing and analysis, as well as invention, patent searching, development and marketing. Students gain from the additional expertise of both the school's business teacher and an outside packaging (1). While researching information on mice, students utilize a variety of such educational technology as computers, CD-ROM, electronic encyclopedias and the Internet (2). Arguably the most important component of this practice is the emphasis on design and problem solving. This ability to confront a complex problem and solve it through both logical and creative means is of extreme importance in today's society. "Three Blind Mice" guides the students step-by-step through this invaluable process (3). Students initially work as a large-group team in discussing the relevant facts about mice and brainstorming ideas which may be incorporated into their designs. As the activity continues, a single student or smaller team approach may be adopted; important deadlines are set (4). During the fabrication and prototyping phase of this practice, students are held responsible for the highest safety standards regarding the use of all tools and equipment as well as safety in general. Poetry also addresses safety concerns. Robert Frost's poem, "Out, Out...," which dramatizes a child's accident with a buzzsaw is introduced and actively discussed during safety instruction (5).

3. ***Document the assessment measures used to determine the extent to which the objectives of the practice have been met.***

Assessment for this practice is broken down into process evaluation and product evaluation.

Trying to assess a design and problem solving process is no easy task. We have found success in this area through the use of portfolio assessment. Students are held responsible for developing a portfolio which comprehensively documents the process they have just completed. The portfolio design responsibilities of the student are as follows:

A. Information Gathering : Students must document all information found about inventions and mice and cite their sources.
B. Brainstorming ideas : First as a whole class, then within smaller groups; students must provide hand drawn sketches and written comments for all initial ideas pertaining to the problem
C. Developing Solutions : With each student drawing from a minimum of three ideas, students then develop a complete set of plans using a computer or supplied drawing tools.
D. Modeling Solutions : Students must construct a three-dimensional model of their solution and provide a written critique with suggested improvements.
E. Prototyping : While building their prototype, students must provide a daily written fabrication log of work accomplished and problems encountered.
F. Testing Solutions : Students must provide written observations of the testing experience, which if fully video taped.
G. Evaluation and Redesign : Upon review of the testing video, students will provide a final written evaluation of their product and suggestions for making an improved version.
H. Video Presentation: At the very end, I conduct and video tape a personal interview with each student, as they make a formal presentation of their improved product.

The following rubric is applied to the above areas and is used as a self-evaluation by the students and a final evaluation by the teacher.

PORTFOLIO GRADING
MOUSE TRAP DESIGN 60% of Project Grade

Step I Research	
1 FACT LISTED	3 pts.
2 FACTS LISTED	6 pts.
4 FACTS LISTED	10 pts.
Step 2 Brainstorming Ideas	
1 design sketched	3 pts.
2 designs sketched	6 pts.
3 or more designs sketched	10 pts.
Step 3 Rough Sketch	
1 sketch neatly done	5 pts.
1 sketch neatly done with dimensions	10 pts.
1 sketch neatly done with dimensions and labels	20 pts.
Step 4 Final Solution Design	
Drawn out neatly	10 pts.
Drawn out neatly and done with dimensions	20 pts.
Drawn out neatly and labeled including dimensions.	30 pts.
Step 5 Fabrication Log	
Brief daily log containing short phrases	3 pts.
Detailed daily log of work accomplished	6 pts.
Detailed daily log of work accomplished also describing problems encountered	10 pts.
Step 6 Testing	
Testing results described briefly	5 pts.
Testing results described well using complete sentences	10 pts.
Step 7 Redesigning and Improving Your Trap	
Brief written suggestions for improvements	5 pts
Well written suggestions and a sketch to show changes	10 pts.
TOTAL = _____	

The product assessment for this practice is broken down into the following areas:

A. Creativity B. Functionality C. Aesthetics D. Efficiency

The following rubric is applied to the above areas and is used as a self-evaluation by the students and a final evaluation by the teacher.

A. Creativity
- the trap displays very little creative thought and basically copies previous designs ..... 5 pts.
- the trap displays sonic creative ideas that show original thought ..... 15 pts.
- the trap is extremely creative and show a lot of original thought ..... 25 pts.

B. Functionality
- the trap functions poorly and needs constant adjustments ..... 5 pts.
- the trap functions well with only some need for adjustments ..... 15 pts.
- the trap functions very well with little or no need for adjustments ..... 25 pts.

C. Aesthetics
- the trap is designed and ability with little or no effort given to appearance ..... 5 pts.
- the trap is somewhat attractive in appearance with some attention paid to detail ..... 15 pts.
- the trap is very pleasing to the eye with a lot of attention paid to detail ..... 25 pts.

D. Efficiency
- the trap seldom works and is very inconsistent ..... 5 pts.
- the trap works between 50% - 70% of the time ..... 15 pts.
- the trap works between 70% - 100% of the time ..... 25 pts.